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**State of Wisconsin**

**Department of Health and Family Services**

**DIVISION OF PUBLIC HEALTH**

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Caroline Garber  
Bureau of Air Management  
Wisconsin Department of Natural Resources  
101 S. Webster St.  
Madison, WI 53707

Dear Ms. Garber:

The Department of Health and Family Services is frequently called upon by your agency to offer guidance on the health risks associated with exposure to chemical contaminants in outdoor air. Jeff Myers recently asked me to summarize our opinion as to the toxicity of coal dust. Coal dust is a complex, heterogeneous mixture containing more than 50 different elements and their oxides. There is extensive literature on the risks associated with coal dust exposure among mine workers and others who may be occupationally exposed to coal dust. Epidemiological studies from Britain and the U.S. conducted over several decades found increased incidence of progressive massive fibrosis and chronic obstructive pulmonary disease in workers exposed at levels near the prevailing occupational exposure limit of  $2 \text{ mg/m}^3$  (expressed as respirable dust). In response to these findings, the American Conference of Governmental Industrial Hygienists (ACGIH) proposed reducing its time-weighted average threshold limit value (TLV-TWA) for bituminous coal dust to  $0.9 \text{ mg/m}^3$  in 1996. This change was adopted by the ACGIH in 1998.

In issuing recommendations for environmental exposure to outdoor air contaminants, the Division of Public Health has adopted a policy whereby an ambient air concentration at which health risk is considered to be *de minimis* is calculated by dividing a TLV-TWA by an appropriate factor to account for variability within the human population and temporal differences in exposure between environmental and occupational scenarios. This factor is expressed as the product of (a) the ratio between the number of hours per week during which environmental exposure and occupational exposure are expected to be incurred ( $168/40$ ), and (b) an uncertainty factor of 10 to account for the sensitivity of susceptible human subpopulations. In the case of coal dust, dividing the TLV-TWA of  $0.9 \text{ mg/m}^3$  by the composite uncertainty factor of 42 yields a risk-based ambient air concentration of  $0.02 \text{ mg/m}^3$  for coal dust. Based on our review, limiting exposure to this level is both necessary and sufficient to offer the public adequate protection from the potential acute and chronic health effects of coal dust exposure.

Please feel free to contact me at 608/266-7480 if you have any questions about this assessment.

Mark A. Werner, Ph.D.  
Toxicologist

cc: Henry Anderson, Wisconsin Division of Public Health  
Jeff Myers, Wisconsin Department of Natural Resources  
Richard Wulk, Wisconsin Department of Natural Resources